CLAIMS

What is Claimed is:

1. A system for measuring a weight upon a seating surface within a motor vehicle, said system comprising:

a ferromagnetic element mechanically coupled to the seating surface such that strain is induced in said ferromagnetic element responsive to the weight thereon; and

a first sensor generating a magnetic field, said magnetic field altered by said strain in said ferromagnetic element, said first sensor generates a signal based upon the alteration in said magnetic field.

2. The system of claim 1, wherein said first sensor comprises a magnet generating a magnetic field, said magnet mounted on the vehicle adjacent said ferromagnetic element.

3. The system of claim 2, wherein said first sensor further comprises an inductor mounted on the vehicle adjacent said ferromagnetic element, said first inductor generating a signal based upon said magnetic field and said strain in said ferromagnetic element.

4. The system of claim 2, wherein said magnet is a permanent magnet.

5. The system of claim 3, wherein said magnet is an electromagnet, said inductor including a coil.

4 ~~6.~~ The system of claim 1, further including an actuator for a vehicle safety device, said actuator actuating said vehicle safety device based upon said signal from said first sensor.

5 ~~7.~~ The system of claim 4 ~~6~~, further including a second sensor mounted adjacent said ferromagnetic element closer to said vehicle safety device than said first sensor, said actuator actuating said vehicle safety device based upon a ~~said~~ signals from said first sensor and said second sensor and a comparison of said signals from said first sensor and said second sensor.

6 ~~8.~~ The system of claim 1, wherein said first sensor measures variation in strain in said ferromagnetic element.

7 ~~9.~~ The system of claim 1, further including a signal processor analyzing a third harmonic of said signal from said first sensor.

8 ~~10.~~ The system of claim 7 ~~9~~, wherein said signal processor includes a filter.

11. A vehicle safety system comprising:

a vehicle seat having a seating surface;

an airbag positioned adjacent said vehicle seat;

crash detection circuitry generating a trigger upon detection of a sufficient impact to said vehicle;

an actuator for actuating said airbag;

a ferromagnetic element mechanically coupled to the seating surface such that strain is induced in said ferromagnetic element by weight on said seating surface; and

a first sensor mounted on the vehicle adjacent said ferromagnetic element and generating a magnetic field, said strain in said ferromagnetic element altering said magnetic field, said first sensor generating a signal based upon said alteration in said magnetic field, said actuator actuating said vehicle safety device based upon said signal from said first sensor and said trigger by said crash detection circuitry;

12. The system of claim 11, wherein said first sensor further includes:

a magnet; and

a first coil mounted on the vehicle adjacent said ferromagnetic element, said magnetic field generating an electromotive force voltage in said first coil, said electromotive force voltage being altered by said alterations in said magnetic field.

13. The system of claim 11, further including a second sensor mounted adjacent said ferromagnetic element closer to said airbag than said first sensor, said actuator actuating said vehicle safety device based upon said signals from said first sensor and said second sensor and a comparison of said signals from said first sensor and said second sensor.

14. The system of claim 9 further including a signal processor receiving said signal from said first sensor, said sensor generating an oscillating magnetic field having a frequency, said signal processor analyzing a third harmonic of said oscillating magnetic field.

15. The system of claim 11 wherein said actuator disables said airbag if said first sensor detects insufficient weight upon said seat surface.

16. A method for controlling actuation of a safety device in a motor vehicle based upon weight upon a seating surface coupled to a ferromagnetic element, said method comprising the steps of:

a) generating a magnetic field adjacent the ferromagnetic element such that a portion of the ferromagnetic element falls within said magnetic field, the ferromagnetic element causing variations in said magnetic field based upon the weight upon said seating surface;

b) detecting said variations in said magnetic field adjacent said ferromagnetic element; and

c) actuating the safety device based upon the detected variation in said magnetic field.

17. The method of claim 16, wherein said generated magnetic field is an oscillating magnetic field.

18. The method of claim 16, further including the steps of:

detecting said variations in said magnetic field adjacent said ferromagnetic element at a first point;

detecting said variations in said magnetic field adjacent said ferromagnetic element at a second point closer to said airbag than said first point;

actuating said airbag based upon said detected variations at said first point and said second point and a comparison of said detected variations at said first point and said second point.

19. The method of claim 16, wherein said step b) further includes the step of measuring variations in a harmonic of said oscillating field.

20. The method of claim 16, wherein said step b) further includes the step of measuring variations in a third harmonic of said oscillating field.